

ABSTRACT

Disclosed is a battery exhibiting an end-of-life (EOL) indicator that also increases the useful capacity. These advantages are achieved by the use of LiBOB as an electrolyte salt or additive to the electrolyte in conjunction with available excess lithium. During discharge, CF_x is reduced at about 2.5 V vs. Li^+/Li , providing the first approximately 800 mAh/g of capacity. Then the LiBOB apparently decomposes at about 1.6 to 1.9 V vs. Li^+/Li , increasing the specific discharge capacity by more than 200 mAh/g and creating a second, lower voltage discharge plateau that provides a ready EOL indicator, particularly useful in critical applications such as implantable medical devices. In some embodiments, the long-term storage capability of a lithium-containing anode is improved by using a LiBOB-containing electrolyte. In some embodiments, this increased storage capability allows dimethylsulfoxide to be added to the electrolyte to increase the voltage, thereby improving the power capability of the battery.